

What is claimed:

1. A method of isolating single walled carbon nanotube structures embedded within raw material, the method comprising:

mixing said structures in a solution including an effective amount of a dispersal agent to substantially disperse said structures within said solution.

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2. The method of claim 1, wherein mixing said structures in said solution substantially separates said structures from contaminants in said raw material.

3. The method of claim 1, wherein said dispersal agent is selected from the group  
10 consisting of detergents with high surfactant activities, deoxycholates, cyclodextrins, chaotropic salts, poloxamers, saponin glycosides and ion pairing agents.

4. The method of claim 1, wherein said dispersal agent comprises a detergent, and said  
15 effective amount of said detergent in said solution is no greater than about 95% of a critical micelle concentration of said detergent.

5. The method of claim 1, wherein said effective amount of said detergent in said  
solution is at least about 50% of a critical micelle concentration of said detergent.

20 6. The method of claim 1, wherein said dispersal agent comprises a detergent having a hydrophilic-lipophilic balance value no greater than about 13.2.

7. The method of claim 1, wherein said dispersal agent is a detergent selected from the  
group consisting of Nonidet P-40, Poloxamer 188, polyoxyethylene sorbitol esters, ammonium  
25 bromides and ammonium chlorides.

8. The method of claim 1, wherein said dispersal agent is selected from the group  
consisting of cyclodextrins, saponin and taurocholic acid.

9. The method of claim 8, wherein said effective amount of said dispersal agent is no greater than about 500 mg/ml.

10. The method of claim 8, wherein said effective amount of said dispersal agent is at least about 5 mg/ml.

11. The method of claim 1, wherein said dispersal agent is a cyclodextrin derivative selected from the group consisting of methyl- $\beta$ -cyclodextrin and 2-hydroxypropyl- $\beta$ -cyclodextrin.

10 12. The method of claim 1, wherein said dispersal agent is a chaotropic salt selected from the group consisting of urea and guanidine.

13. The method of claim 12, wherein the effective amount of said chaotropic salt in said solution is no greater than about 9M.

14. The method of claim 12, wherein the effective amount of said chaotropic salt in said solution is at least about 6M.

15. The method of claim 1, wherein said dispersal agent is a sulfonic acid, and said effective amount of said sulfonic acid in said solution is no greater than about 100 mM.

16. The method of claim 15, wherein said sulfonic acid is selected from the group consisting of 1-heptane-sulfonic acid and 1-octane-sulfonic acid.

25 17. The method of claim 1, further comprising:  
separating said structures from said raw material in said solution by at least one of:  
passing said solution through a filter to form a purified filtrate of said structures; and  
passing said solution through a size exclusion column to form a purified solution of  
said structures.

18. The method of claim 17, wherein said filter includes a pore size no greater than about 0.20  $\mu\text{m}$ .

19. The method of claim 1, further comprising:  
5 centrifuging said solution at a speed in a range no greater than about 10,000xg to sediment said structures in said solution;  
removing said structures from said solution; and  
mixing said structures in a second solution to substantially disperse said structures in said second solution, wherein said second solution is substantially free of said dispersal agent prior to  
10 mixing with said structures.

20. A method of purifying single walled carbon nanotube structures embedded within raw material, the method comprising:  
mixing said structures in a solution including an effective amount of a dispersal agent to to  
15 substantially separate said structures from contaminants in said raw material.

21. A single-walled carbon nanotube product comprising a solution including single-walled carbon nanotube structures coated with a dispersal agent, wherein said structures are substantially dispersed within said solution.

22. The product of claim 21, wherein said structures are further substantially free of contaminants.

23. The product of claim 21, wherein said dispersal agent is selected from the group  
25 consisting of detergents with high surfactant activities, poloxamers, saponin glycosides, deoxycholates, cyclodextrins, chaotropic salts and ion pairing agents.

24. The product of claim 21, wherein said dispersal agent comprises a detergent in said solution in an amount no greater than about 95% of a critical micelle concentration of said detergent.

25. The product of claim 21, wherein said dispersal agent comprises a detergent in said solution in an amount at least about 50% of a critical micelle concentration of said detergent.

26. The product of claim 21, wherein said dispersal agent comprises a detergent having  
5 a hydrophilic-lipophilic balance value no greater than about 13.2.

27. The product of claim 21, wherein said dispersal agent is a detergent selected from the group consisting of Nonidet P-40, Poloxamer 188, polyoxyethylene sorbitol esters, ammonium bromides and ammonium chlorides.

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28. The product of claim 21, wherein said dispersal agent is selected from the group consisting of cyclodextrins, saponin and taurocholic acid.

29. The product of claim 28, wherein said dispersal agent is in said solution in an amount  
15 no greater than about 500 mg/ml.

30. The product of claim 28, wherein said dispersal agent is in said solution in an amount at least about 5 mg/ml.

31. The product of claim 21, wherein said dispersal agent is a cyclodextrin derivative selected from the group consisting of methyl- $\beta$ -cyclodextrin and 2-hydroxypropyl- $\beta$ -cyclodextrin.

32. The product of claim 21, wherein said dispersal agent is a chaotropic salt selected from the group consisting of urea and guanidine.

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33. The product of claim 32, wherein said chaotropic salt is in said solution in an amount no greater than about 9M.

34. The product of claim 32, wherein said chaotropic salt is in said solution in an amount at least about 6M.

35. The product of claim 21, wherein said dispersal agent is a sulfonic acid, and said  
5 sulfonic acid is in said solution in an amount no greater than about 100 mM.

36. The product of claim 35, wherein said sulfonic acid is selected from the group consisting of 1-heptane-sulfonic acid and 1-octane-sulfonic acid.